

What is claimed is:

1. An isolated polynucleotide:

5 (a) a first nucleotide sequence encoding a polypeptide of at least 35 amino acids that has at least 85% identity based on the Clustal method of alignment when compared to a member selected from the group consisting of SEQ ID NOs:2, 4, 6, 8, 12, 14, 16, 18, 20, and 22; and

(b) a second nucleotide sequence comprising a complement of the first nucleotide sequence.

10 2. The isolated polynucleotide of Claim 1, wherein the first nucleotide sequence comprises of a nucleic acid sequence selected from the group consisting of SEQ ID NOs:1, 3, 5, 7, 11, 13, 15, 17, 19, and 21.

3. The isolated polynucleotide of Claim 1 wherein the nucleotide sequence is DNA.

4. The isolated polynucleotide of Claim 1 wherein the nucleotide sequence is RNA.

15 5. A chimeric gene comprising the isolated polynucleotide of Claim 1 operably linked to at least one suitable regulatory sequence.

6. An isolated host cell comprising the chimeric gene of Claim 5.

7. A host cell comprising an isolated polynucleotide of Claim 1.

20 8. The host cell of Claim 7 wherein the host cell is selected from the group consisting of a yeast cell, a bacterial cell, and a plant cell.

9. A virus comprising the isolated polynucleotide of Claim 1.

10. A polypeptide of at least 35 amino acids that has at least 85% identity based on the Clustal method of alignment when compared to a polypeptide selected from the group consisting of SEQ ID NOs:2, 4, 6, 8, 12, 14, 16, 18, 20, and 22.

25 11. A method of selecting a polynucleotide molecule that affects the level of expression of an AMP or adenosine deaminase in a plant cell, the method comprising:

(a) providing a polynucleotide molecule comprising at least 30 contiguous nucleotides derived from the isolated polynucleotide of Claim 1;

30 (b) introducing the polynucleotide molecule into a plant cell that expresses an AMP or adenosine deaminase; and

(c) comparing the level of AMP or adenosine deaminase in the plant cell containing the isolated polynucleotide with the level of AMP or adenosine deaminase in a plant cell that does not contain the isolated polynucleotide.

35 12. The method of Claim 11 wherein the polynucleotide molecule is an isolated polynucleotide of Claim 1.

13. The method of Claim 11 wherein the polynucleotide molecule is an isolated polynucleotide selected from the group consisting of SEQ ID NOs:1, 3, 5, 7, 11, 13, 15, 17, 19, and 21.

14. A method of obtaining a nucleic acid fragment encoding an AMP or adenosine deaminases polypeptide, the method comprising the steps of:

(a) providing an oligonucleotide primer at least 30 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NOs:1, 3, 5, 7, 11, 13, 15, 17, 19, and 21, or derived from a complement of the nucleotide sequences; and

(b) amplifying a nucleic acid sequence using the oligonucleotide primer.

15. A method of obtaining a nucleic acid fragment encoding an AMP or adenosine deaminases polypeptide, the method comprising the steps of:

(a) probing a cDNA or genomic library with a nucleotide probe comprising at least 30 contiguous nucleotides derived from a nucleotide sequence selected from the group consisting of SEQ ID NOs:1, 3, 5, 7, 11, 13, 15, 17, 19, and 21, or derived from a complement of such nucleotide sequences;

(b) identifying a clone that hybridizes with the probe; and

(c) isolating the clone.

16. A composition comprising the isolated polynucleotide of Claim 1.

17. A composition comprising the isolated polypeptide of Claim 10.

18. A transformed plant cell comprising the chimeric gene of Claim 5.

19. A method for producing a transformed cell comprising transforming a cell with the chimeric gene of Claim 5.

20. The method of Claim 19 wherein the cell is a plant cell.

21. The method of Claim 20 wherein the plant cell is a monocot plant cell.

22. The method of Claim 20 wherein the plant cell is a dicot plant.

23. A method of altering the expression level an AMP deaminase or an adenosine deaminase in a host cell comprising:

(a) providing a transformed host cell comprising the chimeric gene of Claim 5; and

(b) growing the transformed host cell under conditions that are suitable for expression of the chimeric gene

wherein expression of the chimeric gene alters the expression levels of the AMP deaminase or the adenosine deaminase in the transformed host cell.

24. A method for evaluating a compound for its ability to inhibit the activity of an AMP deaminase or an adenosine deaminase, the method comprising:

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- (a) providing a transformed host cell with a chimeric gene comprising a nucleic acid fragment encoding an AMP deaminase or an adenosine deaminase;
- (b) growing the transformed host cell under conditions that are suitable for expression of the chimeric gene, wherein the expression produces an AMP deaminase or an adenosine deaminase;
- (c) optionally purifying the AMP deaminase or adenosine deaminase produced;
- 10 (d) treating the AMP deaminase or adenosine deaminase polypeptide with a compound to be tested; and
- (e) determining the inhibitory effect of the compound tested by comparing the activity of the AMP deaminase or adenosine deaminase polypeptide that has been treated to the activity of an untreated enzyme.